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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/082,434	02/22/2002	Eliel Louzoun	42390P13579	6361

8791 7590 11/03/2003

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EXAMINER

TRUONG, BAO Q

ART UNIT	PAPER NUMBER
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2187

DATE MAILED: 11/03/2003

4

Please find below and/or attached an Office communication concerning this application or proceeding.

PR9

Office Action Summary

Application No.

10/082,434

Applicant(s)

LOUZOUN ET AL.

Examiner

Bao Q Truong

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____. 6) ☐ Other: _____

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1. The instant application having Application No. 10/082434 has a total of 33 claims pending in the application; there are 5 independent claims and 28 dependent claims, all of which are ready for examination by the examiner.

Oath/Declaration

2. The applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in 37 C.F.R. § 1.63.

Claim Objections

3. Claim 4 is objected to because of the following informalities:

Claim 4 contains the term "**either**" to set a first alternative without set forth a second alternative. In this office action, the examiner interprets claim 4 as without the above-mentioned term.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1-21 and 28-33 are rejected under 35 U.S.C. 102(e) as being anticipated by Stracovsky et al. (U.S. Patent No. 6,453,370).

Referring to claim 1, Stracovsky teaches a method comprising:

receiving a plurality of commands to access at least one of a plurality of memory banks of a memory as receiving commands to access one of a plurality of memory banks from different requesting devices (see figures 1 and 8; and column 9: lines 30-36); and

scheduling the plurality of commands based at least in part on a status information of at least one of the plurality of memory banks as determining the sequence of operations to perform required request of resource based upon the determined status of the memory bank (see figures 3A-B and 4; Abstract; column 3: lines 15-20; and column 9: lines 40-52).

As to claim 2, Stracovsky further teaches that the memory is a synchronous dynamic random access memory (see column 6: lines 36-42).

As to claim 3, Stracovsky further teaches that the status information is based at least in part on an idle state of the plurality of memory banks with respect to a bank based queuing scheme as having a determining if a memory bank is closed or opened by using information from bank register (see figure 8, column 11: lines 58-67, and column 12: table 2).

As to claim 4, Stracovsky further teaches that the status information is an idle state of the plurality of memory banks as a memory bank is closed or opened (see column 11: lines 58-67, and column 12: table 2).

As to claim 5, Stracovsky further teaches that the status information is based at least in part on a type of a most recent command forwarded to the memory device via a memory bus (see figure 3B, column 7: lines 40-53).

As to claim 6, Stracovsky further teaches that the plurality of commands are read and write commands (see column 6: lines 2-4, column 9: lines 30-36).

Referring to claim 7, Stracovsky discloses a system comprising:
a processor (see figures 1A-D: element 102); and
a logic (see figure 1A-D and 8: element 104), coupled to the processor and to at least one memory device with a plurality of memory banks (see figure 8: element 704), to receive commands to access the memory device as receiving commands to access one of a plurality of

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memory banks from different requesting devices (see figures 1 and 8; and column 9: lines 30-36) and to schedule the commands based at least in part on a status information of the plurality of memory banks as determining the sequence of operations to perform required request of resource based upon the determined status of the memory bank (see figures 3A-B and 4; Abstract; column 3: lines 15-20; and column 9: lines 40-52).

As to claim 8, Stracovsky further discloses that the commands are read and write commands (see column 6: lines 2-4, column 9: lines 30-36).

As to claim 9, Stracovsky further discloses that the status information is based at least in part on a type of a most recent command forwarded to the memory device via a memory bus (see figure 3B, column 7: lines 40-53).

As to claim 10, Stracovsky further discloses that the plurality of memory banks perform in parallel as each bank has its bank register, bank number comparator, etc (see figure 8).

As to claim 11, Stracovsky further discloses that the logic is a network switch or a memory controller (see figure 1A-D and 8: element 104).

As to claim 12, Stracovsky further discloses that the status information is an idle state of the plurality of memory banks as a memory bank is closed or opened (see column 11: lines 58-67, and column 12: table 2).

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As to claim 13, Stracovsky further discloses that the memory is a synchronous dynamic random access memory (see column 6: lines 36-42).

Referring to claim 14, Stracovsky discloses an apparatus comprising:

a first logic (see figure 1B: element 110), coupled to at least one memory device with a plurality of memory banks (see figure 8: element 704), to received commands to access the memory devices (see column 6: lines 54-64); and

a second logic (see figure 1B: element 116), coupled to the first logic, to schedule the received commands based at least in part on a status information of the plurality of memory banks as determining the sequence of operations to perform required request of resource based upon the determined status of the memory bank (see figures 3A-B and 4; Abstract; column 3: lines 15-20; and column 9: lines 40-52).

As to claim 15, Stracovsky further discloses that the apparatus comprises a third logic (see figure 8: element 800) to forward the schedule of the received commands to the memory device via a memory bus.

As to claim 16, Stracovsky further discloses that the apparatus is either one of a network switch or a memory controller (see figure 1A-D and 8: element 104).

As to claim 17, Stracovsky further discloses that the memory device is a synchronous dynamic random access memory (see column 6: lines 36-42).

As to claim 18, Stracovsky further discloses that the received commands are read and write commands (see column 6: lines 2-4, column 9: lines 30-36).

As to claim 19, Stracovsky further discloses that the status information is based at least in part on a type of a most recent command forwarded to the memory device via the memory bus (see figure 3B, column 7: lines 40-53).

As to claim 20, Stracovsky further discloses that the plurality of memory banks perform in parallel as each bank has its bank register, bank number comparator, etc (see figure 8).

As to claim 21, Stracovsky further discloses that the status information is an idle state of the plurality of memory banks as a memory bank is closed or opened (see column 11: lines 58-67, and column 12: table 2).

Referring to claim 28, Stracovsky teaches a method comprising:

receiving a plurality of commands to access at least one of a plurality of memory banks of a memory as receiving commands to access one of a plurality of memory banks from different requesting devices (see figures 1 and 8; and column 9: lines 30-36); and

scheduling the plurality of commands based at least in part on a status information of at least one of the plurality of memory banks as determining the sequence of operations to perform

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required request of resource based upon the determined status of the memory bank (see figures 3A-B and 4; Abstract; column 3: lines 15-20; and column 9: lines 40-52).

The method, taught by Stracovsky, is in a computer environment. Inherently, it can be embodied as instruction codes on a computer readable media and executed by a computing platform to perform the method steps above.

As to claim 29, Stracovsky further teaches that the memory is a synchronous dynamic random access memory (see column 6: lines 36-42).

As to claim 30, Stracovsky further teaches that the status information is an idle state of the plurality of memory banks as a memory bank is closed or opened (see column 11: lines 58-67, and column 12: table 2).

As to claim 31, Stracovsky further teaches that the plurality of memory banks perform in parallel as each bank has its bank register, bank number comparator, etc (see figure 8).

As to claim 32, Stracovsky further teaches that the status information is based at least in part on a type of a most recent command forwarded to the memory device via a memory bus (see figure 3B, column 7: lines 40-53).

As to claim 33, Stracovsky further teaches that the received commands are read and write commands (see column 6: lines 2-4, column 9: lines 30-36).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 22-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stracovsky et al. (U.S. Patent No. 6,453,370) in view of Bass et al. (U.S. Patent No. 5,487,170).

Referring to claim 22, Stracovsky teaches a method comprising:

receiving a plurality of commands to access at least one of a plurality of memory banks of a memory as receiving commands to access one of a plurality of memory banks from different requesting devices (see figures 1 and 8; and column 9: lines 30-36); and

scheduling the plurality of commands based at least in part on a status information of at least one of the plurality of memory banks as determining the sequence of operations to perform required request of resource based upon the determined status of the memory bank (see figures 3A-B and 4; Abstract; column 3: lines 15-20; and column 9: lines 40-52).

However, Stracovsky does not clearly teach a step of arbitrating between the commands to determine priority of access to the memory bus.

Bass teaches a method for dynamically scheduling task requests for access and granting access to system resources wherein group of tasks are assigned a priority level (see Abstract). Furthermore, Bass teaches that, within each group, round robin arbitration assures each task will have access to system resources in turn (see Abstract and column 2: lines 7-22).

It would have been obvious to one having an ordinary level of skill in the art at the time the invention was made to include, in the method taught by Stracovsky, a step of arbitrating between the commands to determine priority of access to the memory bus. This would have been obvious because round robin arbitration, besides scheduling commands to access memory banks based on status information, will assures each command gets its fair share of system resources and is assured of getting a turn (see column 1: lines 40-49 and column 2: lines 24-30).

As to claim 23, Stracovsky further teaches that the memory device is a synchronous dynamic random access memory (see column 6: lines 36-42).

As to claim 24, Stracovsky further teaches that the status information is an idle state of the plurality of memory banks as a memory bank is closed or opened (see column 11: lines 58-67, and column 12: table 2).

As to claim 25, Stracovsky further teaches that the plurality of memory banks perform in parallel as each bank has its bank register, bank number comparator, etc (see figure 8).

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As to claim 26, Stracovsky further teaches that the status information is based at least in part on a type of a most recent command forwarded to the memory device via the memory bus (see figure 3B, column 7: lines 40-53).

As to claim 27, Stracovsky further teaches that the received commands are read and write commands (see column 6: lines 2-4, column 9: lines 30-36).

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Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See Form PTO-892.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bao Q Truong whose telephone number is (703) 308-7090. The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Donald A Sparks, can be reached on (703) 308-1756. The fax phone number for the organization where this application or proceeding is assigned is (703) 746-7239.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

Bao Q Truong

BT

Patent Examiner

October 30, 2003

Hiep T. Nguyen
HIEP T. NGUYEN
PRIMARY EXAMINER

for

Donald Sparks

Supervisory Patent Examiner

Technology Center 2100